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REMARKS

Claims 3, 4, 6-41 and 68-73 are pending herein. Claims 14-41 have been allowed. Claims 8 and 10 have been amended as supported by Figs. 47 and 28 of the present application, respectively. New claim 73 is added hereby as supported by Fig. 28 of the present application. Attached hereto as pages 7 and 8, pursuant to Rule 1.121(c)(1)(ii), is a marked-up version of the amended claims.

1. Claims 3, 4 and 6-9 were rejected under §103 over Arai in view of Okawa, Kolm or Riedel and combined with Scarpa or Keem. To the extent that this rejection might be applied against the amended claims, it is respectfully traversed.

The PTO is alleging that it would have been obvious, based on the teachings in Scarpa or Keem, to provide Arai's gyroscope with roughened contact surfaces between the piezoelectric element and the thin plates (see page 2 of the Office Action). Applicants respectfully disagree for the following reasons.

With reference to Fig. 9 of Keem, plate 23 includes rough surface portions on which piezoelectric element 30 is positioned. With reference to Fig. 2A of Scarpa, piezoelectric elements 4a and 4b are positioned on rough surface portions of separate substrates. In contrast to Scarpa and Keem, claim 8 now recites that one or more holes or recesses is formed entirely through the thin plate sections in the thickness direction. Therefore, even if Arai was combined with either of Scarpa or Keem as asserted in the Office Action, there would still be no disclosure or suggestion of holes or recesses formed entirely through the thin plates, as recited in pending claim 8.

Furthermore, the PTO contends that claim 8 does not specify the location of the holes or recesses in the thin plate sections relative to the P/E elements. Claim 8, however, recites that holes or recesses are formed in the thin plate sections "on which said piezoelectric/elec-

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doesn't
say directly
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restrictive element is formed." As such, it is respectfully submitted that this recitation describes the location of the holes or recesses in relation to P/E elements.

In view of the foregoing, reconsideration and withdrawal of the §103 rejection of claims 3, 4 and 6-9 are respectfully requested.

2. Claims 10-13 and 68-72 were rejected under §103 over Brunnée or Arai in view of Ogawa (U.S. Patent No. 4,805,057) or Ogawa (U.S. Patent No. 4,742,264). To the extent that this rejection might be applied against the amended claims, it is respectfully traversed.

The PTO is alleging that skilled artisans would have been motivated to employ a multi-layered actuator section, as disclosed in either of the Ogawa references, in the actuator device disclosed in Brunnée or Arai.

Ogawa '057 and Ogawa '264 each disclose that internal electrode layers are electrically connected to lead terminals via through holes. Conversely, pending claim 10 now recites that the end surface electrodes are "formed on respective outer side surfaces of said actuator body." Applicants respectfully submit that none of the drawings in the Ogawa references shows a P/E actuator section having end surface electrodes formed on an outer surface of the actuator body, as is now recited in pending claim 10. Furthermore, it is respectfully submitted that skilled artisans would understand that Ogawa's through hole structure is not the equivalent of the claimed end surface electrodes.

In addition, with reference to Fig. 4 of Ogawa '057, for example, the Ogawa references disclose providing through holes through portions of dielectric layers 41-44, which results in a discontinuous electrode layer being formed on portions of the dielectric layers. At such locations where the electrodes are not completely formed on the dielectric layer (i.e., in the vicinity of through holes 42b and 43b shown in Figs. 4(b) and 4(c)), an unbalanced or non-symmetrical P/E element results (i.e., a left-right non-symmetry when viewed from the

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longitudinal direction of the element of Fig. 4). Therefore, during actuation of Ogawa's P/E device, an unwanted bending motion away from the desired displacement direction (in the thickness direction of the element) tends to occur due to the use of non-symmetrical P/E elements. Moreover, undesired bending can also occur in the short or lateral direction of the P/E element.

In view of the foregoing, reconsideration and withdrawal of the §103 rejection of claims 10-13 and 68-72 are respectfully requested.

New dependent claim 73 has been added to further distinguish the present invention over the Ogawa references. For example, new claim 73 recites that the end surface electrodes each include a major plane extending substantially perpendicular to the planes of the electrode films. Applicants respectfully submit that the applied references (i.e., Ogawa '057 and Ogawa '264) disclose an actuator structure in which all of the electrodes are arranged parallel with respect to one another. Accordingly, claim 73 should also be indicated as allowable.

The PTO is requested to confirm receipt and consideration of the Information Disclosure Statements filed on November 27, 2001 and August 12, 2002.

For all of the foregoing reasons, Applicants respectfully submit that all pending claims herein are in condition for allowance. Accordingly, the Examiner is requested to issue a Notice of Allowance for this application in due course.

If the Examiner believes that contact with Applicants' attorney would be advantageous toward the disposition of this case, the Examiner is herein requested to call Applicants' attorney at the phone number noted below.

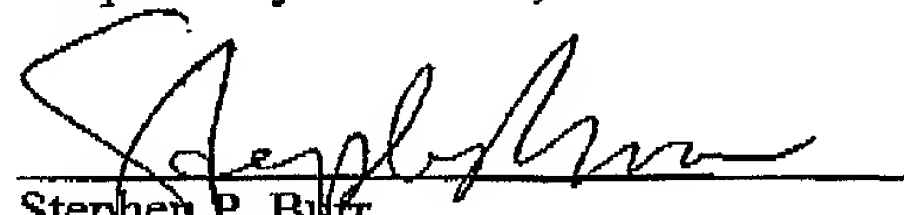
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The Commissioner is hereby authorized to charge any additional fees associated with this communication or credit any overpayment to Deposit Account No. 50-1446.

Respectfully submitted,

November 15, 2002

Date


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Appl'n No.: 09/672,069

8. (Twice Amended) A piezoelectric/electrostrictive device comprising:
at least one actuator section including a piezoelectric/electrostrictive element
secured onto thin plate sections made of metal with an adhesive intervening therebetween,
said at least one actuator section comprising a multilayered member including at least
three or more actuator films each comprising a piezoelectric/electrostrictive layer and
electrode films, wherein

one or more holes or recesses are formed in at least a portion of said thin plate
sections on which said piezoelectric/electrostrictive element is formed, said one or more
holes or recesses being formed entirely through said thin plate sections in the thickness
direction.

10. (Twice Amended) A piezoelectric/electrostrictive device comprising a pair of
mutually opposing thin plate sections made of metal and a fixation section for supporting
said thin plate sections, and including an actuator section with a stacked type
piezoelectric/electrostrictive element fixed on at least one of said thin plate sections by the
aid of an adhesive, said stacked type piezoelectric/electrostrictive element comprising a
plurality of piezoelectric/electrostrictive layers and electrode films, wherein said electrode
films contact upper and lower surfaces of respective piezoelectric/electrostrictive layers
and alternately extend to opposite end surfaces thereof, and end surface electrodes
electrically connect an electrode film that contacts one of said piezoelectric/electrostrictive
layers and an electrode film that contacts another one of said piezoelectric/electrostrictive
layers, said end surface electrodes being formed on respective outer side surfaces of said

VERSION WITH MARKINGS TO SHOW CHANGES MADE
Amended claims